

# New system ensures traceability in the textile industry

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Photo of traceability tag. Credit: Solveig Klug

How can a garment's origin be derived in a safe and credible way? How can the producer guarantee that it has been produced in a socially, environmentally and economically sustainable way? Now, a new, secure traceability system has been developed in a research project at the University of Borås.

Information asymmetry, counterfeits, and lack of transparency—in one word lack of traceability—is a major challenge in the global textiles and

clothing supply [chain](#). QR codes and RFID chips are currently used as traceability tools. However, these are easy to copy.

Tarun Kumar Agrawal, during his doctoral studies in textile management at the Swedish School of Textiles, University of Borås, has developed a new traceability system to solve this.

"The textile supply chain is a complex network and a lot can happen in the process between the various production lines or stages—from the production of fiber and yarn and on to weaving or knitting the textile, the [garment](#) production, the transportation to the retailers, and finally to the consumer. Moreover, consumers want to know where the garment they buy come from, what it is made of, and if it is ethically produced. At the same time, the producers want to show, that their products keep promised quality and are sustainable, and they want to be able to protect themselves from counterfeiting," he says.

## **At the product level: Unique cryptotag printed on the garment**

In his project, Tarun Kumar Agrawal has looked at traceability at the [information](#) and product levels, and how it can be ensured that the information passing the systems is reliable. He has also developed a unique cryptotag that is printed on the finished garment.

"The tag contains tiny particles, which randomly form a unique pattern. By image reading it is possible to identify these patterns, similar as when indentifying a fingerprint. The new traceability system then connects data to the tag," he explains.

The tag has been developed and tested at the lab scale and shows promising results on durability, for example washability, abrasion

resistance and stretchability.

"It is important that the tag is durable and that the particles, that form the unique pattern, consist and can be read off. This is also important when the garment is worn out and goes to recycling, in order to be able to deduce what material the [textile](#) consists of, for example, if it is pure or mixed material," he continues.

## **At the information level: Block chain technology use**

The traceability system has been developed to be completely open, so that the stakeholders, who are connected to it, can follow what is happening, from production of raw material to finished garment, and further out to the customer, through the entire supply chain.

"The system lacks central authority, which means that there is no individual party that owns and verifies the information transfer. Instead, so-called block chain technology has been used, which is the same technology behind virtual currency transactions, such as bitcoin, to make the information transfer secure. This reduces the risk of the information being manipulated by one single party. Since the system is open to all connected stakeholders, they can follow the production process all the way. The technology helps to develop a technology-based trust among the stakeholders. And, the customer can further know the history of the garment using the system," he says.

The traceability system is very promising, and the next step is to scale it up, and to improve the algorithm that has been used.

"Now we look forward for cooperation with some companies to try and test the system on their supply chains."

Sustainable development has been a fundamental aspect of the project.

"Investing in the infrastructure is crucial for the industry—to implement [sustainable development](#), as well as taking responsibility for the production and consumption. With control and transparency of the supply chain for the production of textiles and garments, it will also be possible to actualize reduced climate impact. Global partnerships is the main key in the work for sustainable development," concludes Tarun Kumar Agrawal.

**More information:** Contribution to development of a secured traceability system for textile and clothing supply chain. [hb.diva-portal.org/smash/record.jsf?pid=diva2%3A1303821&dswid=-7235](https://hb.diva-portal.org/smash/record.jsf?pid=diva2%3A1303821&dswid=-7235)

Provided by University of Borås

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